

Claims

- [c1] A control circuit for configuring at least one I/O module connector pin, said circuit comprising at least one port controlling a configuration of the at least one pin.
- [c2] A control circuit in accordance with Claim 1 wherein said at least one port comprises at least one of a Pull-Down (PD) port, a Pull-Up (PU) port, a Discrete High (DH) port, a Discrete Low (DL) port, a positive 15 volt (P15V) port, a negative 15 volt (N15V) port, a range (RANGE) port, and a voltage out (VOUT) port.
- [c3] A control circuit in accordance with Claim 1 further comprising at least one switch assembly comprising a switch, said at least one port controlling whether a respective said at least one switch is in an open state or a closed state.
- [c4] A control circuit in accordance with Claim 3 wherein the at least one switch assembly comprises at least one of a Pull-Down switch, a Pull-Up switch, a Discrete High switch, a Discrete Low switch, a positive 15 volt switch, a negative 15 volt switch, a range switch, and a voltage out switch.
- [c5] A control circuit in accordance with Claim 3 wherein the configuration of the at least one switch assembly determines the configuration of the at least one pin.
- [c6] A control circuit in accordance with Claim 3 wherein a switch state of said circuit switches controlling the at least one pin to be a discrete input or output, an analog input or output, a power, and a ground.
- [c7] An I/O module comprising:
at least one connector pin; and
a control circuit comprising a plurality of switches, said switches controlling a configuration of the at least one pin.
- [c8] An I/O module in accordance with Claim 7 wherein said circuit further

comprising at least one port controlling a configuration of a respective at least one switch.

[c9] An I/O module in accordance with Claim 7 wherein an energization state of each said at least one port controlling a state of a respective at least one switch.

[c10] An I/O module in accordance with Claim 8 wherein said at least one port comprises at least one of a Pull-Down (PD) port, a Pull-Up (PU) port, a Discrete High (DH) port, a Discrete Low (DL) port, a positive 15 volt (P15V) port, a negative 15 volt (N15V) port, a range (RANGE) port, and a voltage out (VOUT) port.

[c11] An I/O module in accordance with Claim 7 wherein said switches comprising at least one of a Pull-Down switch, a Pull-Up switch, a Discrete High switch, a Discrete Low switch, a positive 15 volt switch, a negative 15 volt switch, a range switch, and a voltage out switch.

[c12] An I/O module in accordance with Claim 3 wherein a switch state of said circuit switches controlling said at least one connector pin to be a discrete input or output, an analog input or output, a power, and a ground.

[c13] A PLC comprising:
a CPU; and
an I/O module comprising at least one connector pin and a control circuit comprising a plurality of ports, a configuration of the at least one connector pin determined by an energization state of said ports.

[c14] A PLC in accordance with Claim 13 wherein said at least one port comprises at least one of a Pull-Down (PD) port, a Pull-Up (PU) port, a Discrete High (DH) port, a Discrete Low (DL) port, a positive 15 volt (P15V) port, a negative 15 volt (N15V) port, a range (RANGE) port, and a voltage out (VOUT) port.

[c15] A PLC in accordance with Claim 13 further comprising at least one switch assembly comprising a switch, said at least one port controlling whether a

respective said at least one switch is in an open state or a closed state.

[c16] A PLC in accordance with Claim 15 wherein the at least one switch assembly comprises at least one of a Pull-Down switch, a Pull-Up switch, a Discrete High switch, a Discrete Low switch, a positive 15 volt switch, a negative 15 volt switch, a range switch, and a voltage out switch.

[c17] A PLC in accordance with Claim 15 wherein the configuration of the at least one switch assembly determines the configuration of said at least one pin.

[c18] A PLC in accordance with Claim 15 wherein a switch state of said circuit switches controlling the at least one pin to be a discrete input or output, an analog input or output, a power, and a ground.

[c19] A method for configuring at least one connector pin utilizing a control circuit, the control circuit including at least one port, said method comprising:
providing an energization state to the at least one port; and
controlling a configuration of the at least one connector pin utilizing the energization state of the at least one port.

[c20] A method in accordance with Claim 19 wherein the at least one port comprises at least one of a Pull-Down (PD) port, a Pull-Up (PU) port, a Discrete High (DH) port, a Discrete Low (DL) port, a positive 15 volt (P15V) port, a negative 15 volt (N15V) port, a range (RANGE) port, and a voltage out (VOUT) port.

[c21] A method in accordance with Claim 19 wherein the control circuit includes at least one switch assembly including a switch, said method further comprising:
utilizing the energization state of the at least one port to control whether a respective at least one switch is in an open state or a closed state; and
controlling a configuration of the at least one connector pin utilizing the state of the at least one switch.

- [c22] A method in accordance with Claim 21 wherein the at least one switch assembly includes at least one of a Pull-Down switch, a Pull-Up switch, a Discrete High switch, a Discrete Low switch, a positive 15 volt switch, a negative 15 volt switch, a range switch, and a voltage out switch.
- [c23] A method in accordance with Claim 21 further comprising utilizing a switch state of the switches to control the at least one pin to be a discrete input or output, an analog input or output, a power, and a ground.

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